

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 00-2					FOR NSF USE ONLY		
NSF 00-78			07/19/00			NSF PROPOSAL NUMBER	
FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.)					0092059		
DGE - IGERT PREPROPOSALS							
DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)		FILE LOCATION	
				111089470			
EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)		SHOW PREVIOUS AWARD NO. IF THIS IS <input type="checkbox"/> A RENEWAL <input type="checkbox"/> AN ACCOMPLISHMENT-BASED RENEWAL		IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF YES, LIST ACRONYMS(S)			
026000937							
NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE			ADDRESS OF Awardee ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE				
University of New Hampshire			University of New Hampshire				
AWARDEE ORGANIZATION CODE (IF KNOWN)			Service Bldg., Room 111				
0025890000			Durham, NH. 03824				
NAME OF PERFORMING ORGANIZATION, IF DIFFERENT FROM ABOVE			ADDRESS OF PERFORMING ORGANIZATION, IF DIFFERENT, INCLUDING 9 DIGIT ZIP CODE				
PERFORMING ORGANIZATION CODE (IF KNOWN)							
IS Awardee ORGANIZATION (Check All That Apply) (See GPG II.D.1 For Definitions) <input type="checkbox"/> FOR-PROFIT ORGANIZATION <input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> MINORITY BUSINESS <input type="checkbox"/> WOMAN-OWNED BUSINESS							
TITLE OF PROPOSED PROJECT A Measurement/Modeling/Visualization Program in Earth System's Chemical Dynamics \ (ESCD\)							
REQUESTED AMOUNT \$ 2,633,717		PROPOSED DURATION (1-60 MONTHS) 60 months		REQUESTED STARTING DATE 06/01/01		SHOW RELATED PREPROPOSAL NO., IF APPLICABLE	
CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW							
<input type="checkbox"/> BEGINNING INVESTIGATOR (GPG 1.A.3)			<input type="checkbox"/> VERTEBRATE ANIMALS (GPG II.D.12) IACUC App. Date _____				
<input type="checkbox"/> DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.D.1)			<input type="checkbox"/> HUMAN SUBJECTS (GPG II.D.12)				
<input type="checkbox"/> PROPRIETARY & PRIVILEGED INFORMATION (GPG II.D.10)			Exemption Subsection _____ or IRB App. Date _____				
<input type="checkbox"/> NATIONAL ENVIRONMENTAL POLICY ACT (GPG II.D.10)			<input type="checkbox"/> INTERNATIONAL COOPERATIVE ACTIVITIES: COUNTRY/COUNTRIES _____				
<input type="checkbox"/> HISTORIC PLACES (GPG II.D.10)			<input type="checkbox"/> FACILITATION FOR SCIENTISTS/ENGINEERS WITH DISABILITIES (GPG V.G.)				
<input type="checkbox"/> SMALL GRANT FOR EXPLOR. RESEARCH (SGER) (GPG II.D.12)			<input type="checkbox"/> RESEARCH OPPORTUNITY AWARD (GPG V.H)				
PI/PD DEPARTMENT Climate Change Research Center		PI/PD POSTAL ADDRESS Inst. for Study of Earth, Oceans & Space					
PI/PD FAX NUMBER 603-862-0188		39 College Road, Morse Hall					
		Durham, NH 03824					
		United States					
NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Electronic Mail Address			
PI/PD NAME Robert W Talbot	PhD	1981	603-862-1546	robert.talbot@unh.edu			
CO-PI/PD Patrick M Crill	Ph.D.	1984	603-862-1792	patrick.crill@unh.edu			
CO-PI/PD Steve Frolking	Ph.D.	1993	603-862-0244	steve.frolking@unh.edu			
CO-PI/PD Karen L Von Damm	PhD	1984	603-862-0142	kvd@eos.sr.unh.edu			
CO-PI/PD Charles J Vorosmarty	Ph.D.	1991	603-862-3978	charles.vorosmarty@unh.edu			

CERTIFICATION PAGE

Certification for Principal Investigators and Co-Principal Investigators:

I certify to the best of my knowledge that:

- (1) the statements herein (excluding scientific hypotheses and scientific opinions) are true and complete, and
 (2) the text and graphics herein as well as any accompanying publications or other documents, unless otherwise indicated, are the original work of the signatories or individuals working under their supervision. I agree to accept responsibility for the scientific conduct of the project and to provide the required progress reports if an award is made as a result of this proposal.

I understand that the willful provision of false information or concealing a material fact in this proposal or any other communication submitted to NSF is a criminal offense (U.S. Code, Title 18, Section 1001).

Name (Typed)	Signature	Social Security No.*	Date
PI/PD Robert W Talbot		*ON FAST-LANE SUBMISSIONS* SSNs are confidential and are not displayed	
Co-PI/PD Patrick M Crill			
Co-PI/PD Steve Frolking			
Co-PI/PD Karen L Von Damm			
Co-PI/PD Charles J Vorosmarty			

Certification for Authorized Organizational Representative or Individual Applicant:

By signing and submitting this proposal, the individual applicant or the authorized official of the applicant institution is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding Federal debt status, debarment and suspension, drug-free workplace, and lobbying activities (see below), as set forth in Grant Proposal Guide (GPG), NSF 00-2. Willful provision of false information in this application and its supporting documents or in reports required under an ensuring award is a criminal offense (U. S. Code, Title 18, Section 1001).

In addition, if the applicant institution employs more than fifty persons, the authorized official of the applicant institution is certifying that the institution has implemented a written and enforced conflict of interest policy that is consistent with the provisions of Grant Policy Manual Section 510; that to the best of his/her knowledge, all financial disclosures required by that conflict of interest policy have been made; and that all identified conflicts of interest will have been satisfactorily managed, reduced or eliminated prior to the institution's expenditure of any funds under the award, in accordance with the institution's conflict of interest policy. Conflict which cannot be satisfactorily managed, reduced or eliminated must be disclosed to NSF.

Debt and Debarment Certifications

(If answer "yes" to either, please provide explanation.)

Is the organization delinquent on any Federal debt?

Yes ☐

No ☒

Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency?

Yes ☐

No ☒

Certification Regarding Lobbying

This certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding \$100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding \$150,000.

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE		SIGNATURE	DATE
NAME/TITLE (TYPED) Steven Bernstein, Assoc. Director O			07/18/00
TELEPHONE NUMBER 603-862-4865	ELECTRONIC MAIL ADDRESS steven.bernstein@unh.edu	FAX NUMBER 603-862-3564	

*SUBMISSION OF SOCIAL SECURITY NUMBERS IS VOLUNTARY AND WILL NOT AFFECT THE ORGANIZATION'S ELIGIBILITY FOR AN AWARD. HOWEVER, THEY ARE AN INTEGRAL PART OF THE INFORMATION SYSTEM AND ASSIST IN PROCESSING THE PROPOSAL. SSN SOLICITED UNDER NSF ACT OF 1950, AS AMENDED.

PROPOSAL NO.: 0092059
PRINCIPAL INVESTIGATOR: Talbot, Robert
INSTITUTION NAME: University of New Hampshire
TITLE: A Measurement/Modeling/Visualization Program in Earth System's Chemical Dynamics (ESCD)
NSF RECEIVED DATE: 07/18/2000

An NSF-IGERT sponsored traineeship:

A Measurement/Modeling/Visualization Program in
Earth System's Chemical Dynamics (ESCD)

Director: Dr. Robert W. Talbot
Institute for the Study of Earth, Oceans, and Space
University of New Hampshire, Durham, NH 03824

Project Summary:

The proposed IGERT program in Earth System's Chemical Dynamics (ESCD) will be a principal mechanism for training the next generation of Ph.D. scientists in Earth Science at the UNH Institute for the Study of Earth, Oceans, and Space (EOS). Building on the PIs' existing teaching and advising roles in the UNH Graduate School, ESCD will emphasize interdisciplinary studies that contribute to understanding the global integrated behavior of the Earth's atmosphere, hydrologic, and terrestrial components. The chemical and dynamical processes in and amongst these reservoirs are intimately coupled, and the ESCD program will emphasize these interactions. The overall goal of the program is to train Ph.D. students to describe and understand the interactive physical, chemical, and biological processes that regulate the Earth System as a unique environment for life, the changes that are occurring to it, and how it is influenced by human actions. The centerpiece of the ESCD program will be two courses on the fundamentals and applications of environmental measurements, data analysis, and modeling. Students will operate sophisticated field and laboratory instrumentation. They will generate data products that will be utilized in modeling and analysis applications to emphasize principal concepts and facilitate interpretation of the data. Results will also be explored using advanced visualization hardware and interactive software. Ongoing major research projects in EOS will provide students with hands-on experience in regional-to-global scale field programs. Remote sensing, geographic information systems, and satellite databases are readily available to EOS students to enhance their research activities. EOS has strong ties to numerous government and private laboratories that will be exploited to provide cutting-edge research/learning opportunities for our Ph.D. students. The ESCD program will provide doctoral students with exciting, crosscutting initiatives to prepare them to lead research efforts of the next generation, an era of increasing human domination of many global-scale processes.

PROPOSAL NO 0092059	INSTITUTION U of New Hampshire		PLEASE RETURN BY 09/24/03		
PRINCIPAL INVESTIGATOR Talbot, Robert W.		NSF PROGRAM IGERT PREPROPOSALS			
PROPOSAL TITLE A Measurement/Modeling/Visualization Program in Earth System's Chemical Dynamics (ESCD)					
	REVIEWER	NSF I.D GENDER DISCIPLINE PIN	DATE SENT RETURNED	REVIEWER (R) PANELIST (P) BOTH (B)	REVIEWED (R) NOT REVIEWED (N) COI (C) LATE (L)
1	Dr. Tracy L. Benning, Department of Environmental Science University of San Francisco 2130 Fulton Street San Francisco, CA 94117-1080 tlbenning@usfca.edu	YH0721552 Female Ecology *****	09/25/00	P	P
2	Dr. Douglas O. Fuller, Geography George Washington University 619 21st Street, NW Washington, DC 20037-2353 dfuller@gwu.edu	US0788727 Male Geography *****	09/25/00	P	P
3	Dr. Curtis M. Jolly, Agricultural Economics and Rural Sociology, 212 Comer Hall Auburn University Auburn, AL 36849- cjolly@acesag.auburn.edu	QR0789570 Male Other Sciences NEC *****	09/25/00	P	P
4	Dr. Karen Kainer, Center for Latin American Studies-TCD University of Florida Grinter Gainesville, FL 32611- kkainer@latam.ufl.edu	PZ0789568 Female Environmental Sciences *****	09/25/00	P	P
5	Dr. Gabriel G. Katul, School of the Environment Duke University Box 90328 Durham, NC 27708-0077 gaby@duke.edu	PU0736599 Male Geological Sciences *****	09/25/00	P	P
6	Professor Michael Lynch, Department of Biology Indiana University Bloomington Jordan Hall Bloomington, IN 47405- mlynch@bio.indiana.edu	NA0171023 Male Life Science Biological *****	09/25/00	P	P

PROPOSAL NO 0092059	INSTITUTION U of New Hampshire		PLEASE RETURN BY 09/24/03		
PRINCIPAL INVESTIGATOR Talbot, Robert W.		NSF PROGRAM IGERT PREPROPOSALS			
PROPOSAL TITLE A Measurement/Modeling/Visualization Program in Earth System's Chemical Dynamics (ESCD)					
	REVIEWER	NSF I.D GENDER DISCIPLINE PIN	DATE SENT RETURNED	REVIEWER (R) PANELIST (P) BOTH (B)	REVIEWED (R) NOT REVIEWED (N) COI (C) LATE (L)
7	Dr. Errol E. Meidinger, School of Law SUNY at Buffalo 719 O'Brian Hall, North Campus Buffalo, NY 14260-1100 eemeid@buffalo.edu	TN0524906 Male Law *****	09/25/00	P	P
8	Dr. Helen J. Michaels, Department of Biological Sciences Bowling Green State University Life Science Building Bowling Green, OH 43403-0212 hmichae@bgsu.edu	WN0572231 Female Ecology *****	09/25/00	P	P
9	Dr. Debbie Niemeier, Civil and Environmental Engineering U of Cal Davis 3127 Engineering III One Shield Avenue Davis, CA 95616-5294 niemeier@ucdavis.edu	MS0760504 Female Engineering-Civil *****	09/25/00	P	P
10	Dr. Charles H. Nilon, Dept. of Fisheries and Wildlife Sciences University of Missouri-Columbia 302 Anheuser-Busch Natural Resources Bld Columbia, MO 65211-7240 nilonc@missouri.edu	MR0766545 Male Environmental Biology *****	09/25/00	P	P
11	Dr. Peter Nowak, Department of Rural Sociology University of Wisconsin 350 Agricultural Hall 1450 Linden Drive Madison, WI 53706- pnowak@facstaff.wisc.edu	EM0585991 Male Sociology *****	09/25/00	P	P
12	Dr. Russell J. Qualls, Biological & Agricultural Engr. University of Idaho P.O. Box 440904 Moscow, ID 83844-0904 rqualls@uidaho.edu	JG0736591 Male Geological Sciences *****	09/25/00 09/21/00	P	R Poor

PROPOSAL NO 0092059	INSTITUTION U of New Hampshire	PLEASE RETURN BY 09/24/03			
PRINCIPAL INVESTIGATOR Talbot, Robert W.		NSF PROGRAM IGERT PREPROPOSALS			
PROPOSAL TITLE A Measurement/Modeling/Visualization Program in Earth System's Chemical Dynamics (ESCD)					
REVIEWER	NSF I.D GENDER DISCIPLINE PIN	DATE SENT RETURNED	REVIEWER (R) PANELIST (P) BOTH (B)	REVIEWED (R) NOT REVIEWED (N) COI (C) LATE (L)	REVIEWER RATING
13 Dr. Eric Shulenberger, Office of Research University of Washington Box 355350 Seattle, WA 98195-6613 ericshul@u.washington.edu	VH0128487 Male Biological Oceanography *****	09/25/00	P	P	
14 Dr. James A. Teeri, Biological Station University of Michigan Ann Arbor 7th Floor Dennison Building 501 East University Avenue Ann Arbor, MI 48109-1274 jateeri@umich.edu	000101045 Male Ecology *****	09/25/00 09/19/00	P	R	Fair
15 Dr. Jeanne VanBriesen, Dept. of Biomedical & Health Engr. Carnegie Mellon University Porter Hall 119 5000 Forbes Avenue Pittsburgh, PA 15213-3890 jeanne@cmu.edu	EY0788767 Female Geological Sciences *****	09/25/00 09/19/00	P	R	Fair

NATIONAL SCIENCE FOUNDATION

Panel Summary Jacket Copy

Proposal:0092059

PI Name: Talbot, Robert W.

PANEL: IGERT-E1
INSTITUTION: University of New Hampshire
NSF PROGRAM: Integrative Graduate Education and Research
Training Program, IGERT-Preproposal
PRINCIPAL INVESTIGATOR:
PROPOSAL TITLE: A Measurement/Modeling/Visualization Program in
Earth System's Chemical Dynamics (ESCD)

PANEL SUMMARY:

Strengths: The research program is a high national/international priority. The investigators are well qualified and productive.

Weaknesses: Very little information is provided to describe the detailed nature of the training program. Because the training program is not well described, it is difficult to evaluate the potential merit of the proposed research training.

Reasons for Panel Ranking: The inadequate description of the training program makes this proposal very difficult to evaluate.

☐ Highly Recommended ☐ Recommended ☒ Not Recommended

PANEL RECOMMENDATION:

PANEL RECOMMENDATION KEY:

DNF:Do Not Fund, FIP:Fund If Possible, F:Fund

APPROVED BY: JACKSON, YVETTE

NATIONAL SCIENCE FOUNDATION
Review (Jacket Copy)

Proposal:0092059

PI Name: Talbot, Robert W.

Title: A Measurement/Modeling/Visualization Program in Earth System's Chemical Dynamics (ESCD)

Institution: University of New Hampshire

NSF Program: Integrative Graduate Education and Research Training Program, IGERT-Preproposal

Principal Investigator: Talbot, Robert W.

Received Date: 09/21/00

Rating: Poor

Review:

1) Intellectual Merit and quality of proposed activity.

The proposed grad training activities focus on two courses: a measurement course (instrument setup, data collection, retrieval, and processing), and a modeling course (data analysis, interpretation and modeling). These courses are trans-disciplinary but do not seem to promote multidisciplinary work. These courses should be in place for EOS to carry out its regular research programs. The proposal indicates that 'the program will [italics mine] be designed to be sufficiently flexible to permit a wide range of research endeavors yet firmly based in the primary disciplines of à' and that 'we plan to strengthen and formalize our graduate training program with a clearly focused and unique program in ECSD.' But little or no indication is given of how they will go about doing this.

2) What are the broader impacts?

This proposal is integrative within scientific disciplines (atmospheric science, hydrology, and terrestrial processes) and is the type of work that is more appropriate to a NOAA type solicitation.

Summary

This proposal does not present an innovative, multidisciplinary approach to graduate training. Much more detail would have been needed to warrant a second look at this work (i.e., a full proposal).

Reviewer:

Qualls, Russell J.

Biological & Agricultural Engr.

Email: rqualls@uidaho.edu

Suggested Reviewers:

None

Conflict of Interest:

None

NATIONAL SCIENCE FOUNDATION
Review (Jacket Copy)

Proposal:0092059

PI Name:Talbot, Robert W.

Title:A Measurement/Modeling/Visualization Program in Earth System's Chemical Dynamics (ESCD)

Institution:University of New Hampshire

NSF Program:Integrative Graduate Education and Research Training Program, IGERT-Preproposal

Principal Investigator:Talbot, Robert W.

Received Date:09/19/00

Rating:Fair

Review:

This is a review of the proposal by R. W. Talbot et al. (NSF 0092059) "A measurement/modeling/visualization program in earth system's chemical dynamics (ESCD)." Faculty at the U. of New Hampshire request funding to establish an IGERT program. The program goal is to "...train Ph.D. students to describe and understand the interactive physical, chemical, and biological processes that regulate the Earth System as a unique environment for life, the changes that are occurring to it, and how it is influenced by human actions.

The "...centerpiece of the ESCD program will be two new team-taught graduate courses..." The first will focus on experimental methods. The second will focus on "...data analysis, data interpretation, and modeling." Students will participate in other activities including existing funded research programs.

Criterion 1: Intellectual merit. The research programs have very high merit. The training programs are difficult to evaluate. There is very little information provided to describe the detailed nature of the training that the students would receive.

Criterion 2: Broader impacts. This is difficult to evaluate because of the sparse description of the training activities.

Summary statement: The proposal would benefit from a more comprehensive description of the actual training program.

Summary rating: Fair.

Reviewer:

Teeri, James A.
Biological Station

Email:jateeri@umich.edu

Suggested Reviewers:

None

Conflict of Interest:

NATIONAL SCIENCE FOUNDATION
Review (Jacket Copy)

Proposal:0092059

PI Name: Talbot, Robert W.

Title: A Measurement/Modeling/Visualization Program in Earth System's Chemical Dynamics (ESCD)

Institution: University of New Hampshire

NSF Program: Integrative Graduate Education and Research Training Program, IGERT-Preproposal

Principal Investigator: Talbot, Robert W.

Received Date: 09/19/00

Rating: Fair

Review:

(X) NSF 0092059

A Measurement/Modeling/Visualization Program in Earth System's Chemical Dynamics

FAIR

What is the intellectual merit and quality of the proposed activity?

À Importance and coherence of the multidisciplinary research theme

À Quality of the proposed major research efforts and appropriateness to the multidisciplinary research theme

The area of study is coupled processes in terrestrial and atmospheric chemistry. The importance is clear and the need for interdisciplinary research in this area is great. However, the proposal does not present a coherent research plan to address this need. Individual PIs research interests and past and current efforts are discussed but little effort was made to present a comprehensive plan for the research that would be supported by an IGERT grant. It appears that the IGERT supported students will work for individual PIs as adjuncts to current research projects. The major interdisciplinary aspect for students appears to be working in a multidisciplinary environment, but this is insufficient to justify such a large project. Specific plans for multidisciplinary integrative research supervised by the PIs in a collaborative manner needs to be provided.

What are the broader impacts of the proposed activity?

À Quality and innovation in the planned graduate education and training activities, including provisions for developing professional and personal elements such as communication, teamwork, leadership, and instruction in ethics and the responsible conduct of research

While the plans include the basics of a graduate program, it is unclear what broader impacts the work will have beyond the specific research that is currently ongoing in the PIs individual research programs.

Administrative Plans

NATIONAL SCIENCE FOUNDATION
Review (Jacket Copy)

Proposal:0092059

PI Name:Talbot, Robert W.

- À Effectiveness of career development opportunities - internships in the international, industrial settings
- À Appropriateness of the formal administrative plan and organizational structure in assuring fair and effective allocation of group resources, including the institution's intellectual commitment to the project
- À Effectiveness of the strategy for preparing a diverse, globally-aware, science and engineering workforce, including operational plans for student recruitment and retention
- À Appropriateness of the plans for assessment of project performance

No specific career development plans are outlined. The administrative structure is not specific; it is unclear how students and research projects will be selected. No specifics for recruiting minority or disadvantaged students are provided. No specific plans to assess the project performance are given.

Reviewer:

VanBriesen, Jeanne
Dept. of Biomedical & Health Engr.

Email:jeanne@cmu.edu

Suggested Reviewers:

None

Conflict of Interest:

None